See Project 758

For all other Docs

Including Cert. C-LSH108-157/D.

See AE 758-4

DCLs

ICA.

Apine.

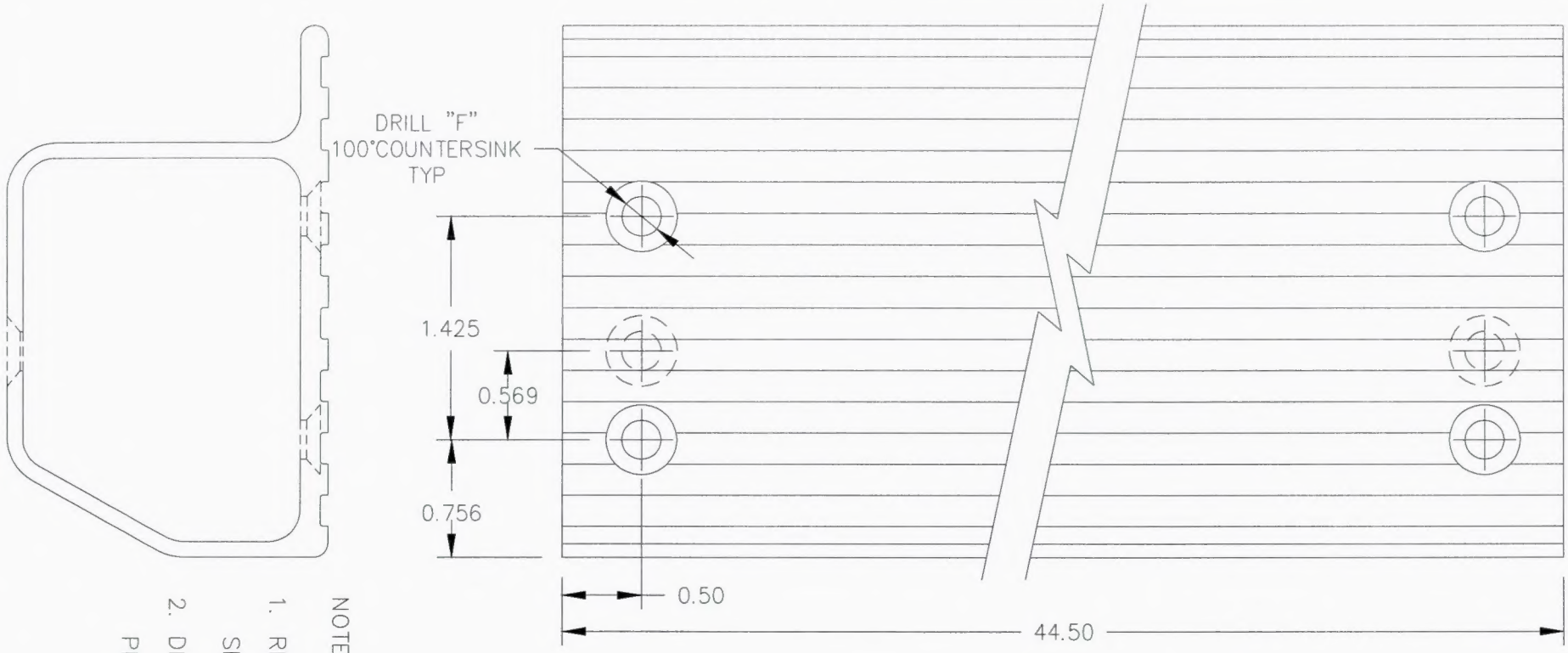
Dibt/AME.

Mike Lequesne.

(h) 403.609.7964

(c) 403.815.5968

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL RELEASE		07/05/08



NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. DEGREASE, ALODINE AND PRIME PRIOR TO ASSEMBLY.

QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL
1	79832-01	01	STEP	78230 STEP EXTRUSION
01	LIST OF MATERIALS			

APPROVALS	DATE
DRAWN: R. RATHWELL	07/05/08
CHECKED: E. BURGOIN	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

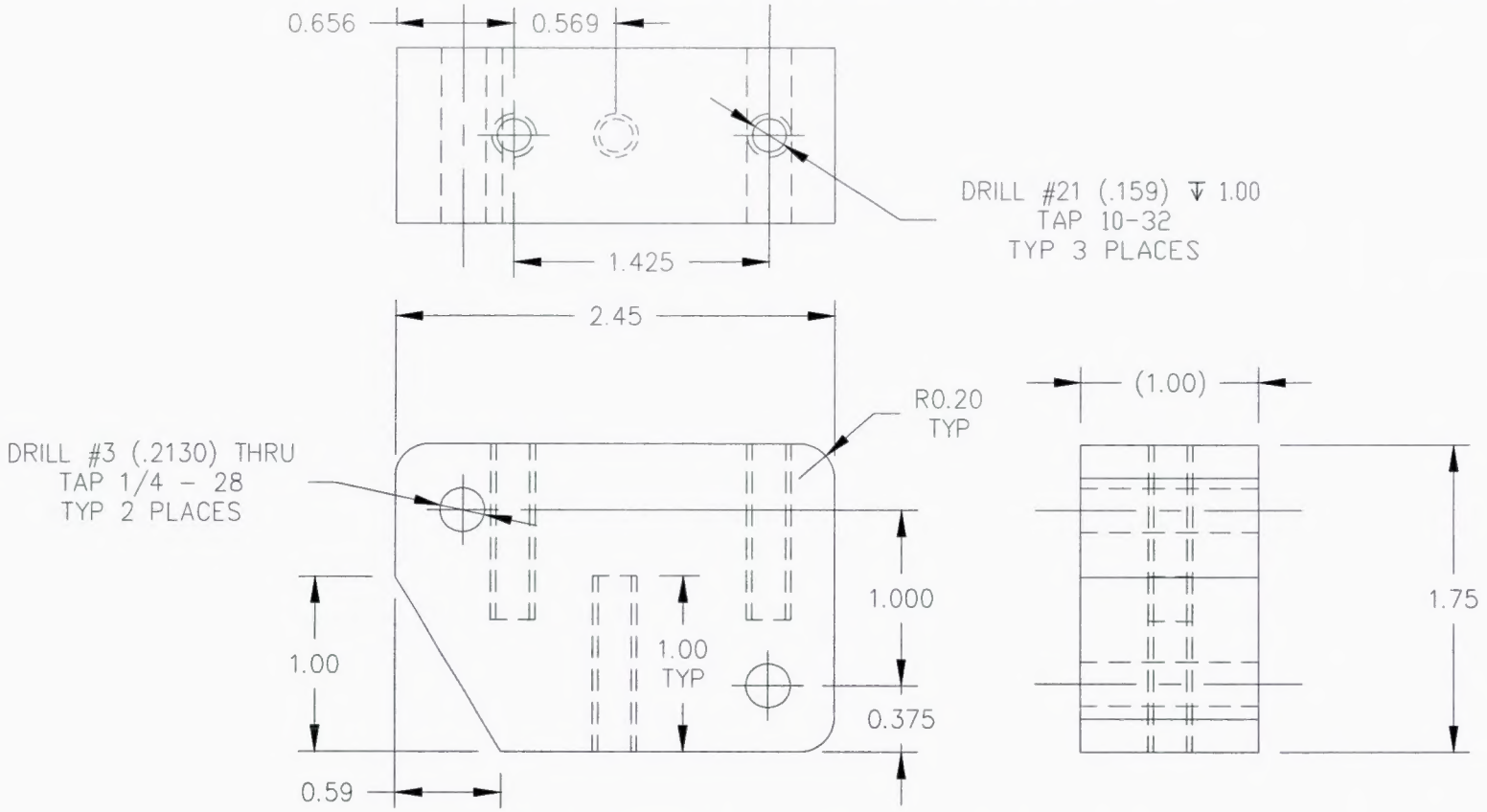
DECIMALS		ANGLES
X.XXX	±0.010	±1/2°
X.XX	±0.03	
X.X	±0.1	

AERO DESIGN LTD.
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M
2013 – 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7
tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca

BELL 212/412/205A-1/205B RAPPEL STEP STEP

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	79830	0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	*	*	*



NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. DEGREASE AND ALODINE PRIOR TO ASSEMBLY.

1	79833-01	01	BLOCK	6061-T651 ALUM PLATE	AMS-QQ-A-250/11	T=1.0
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					

APPROVALS	DATE
DRAWN: R. RATHWELL	07/05/08
CHECKED: E. BURGOIN	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

DECIMALS		ANGLES
X.XXX	±0.010	±1/2°
X.XX	±0.03	
X.X	±0.1	

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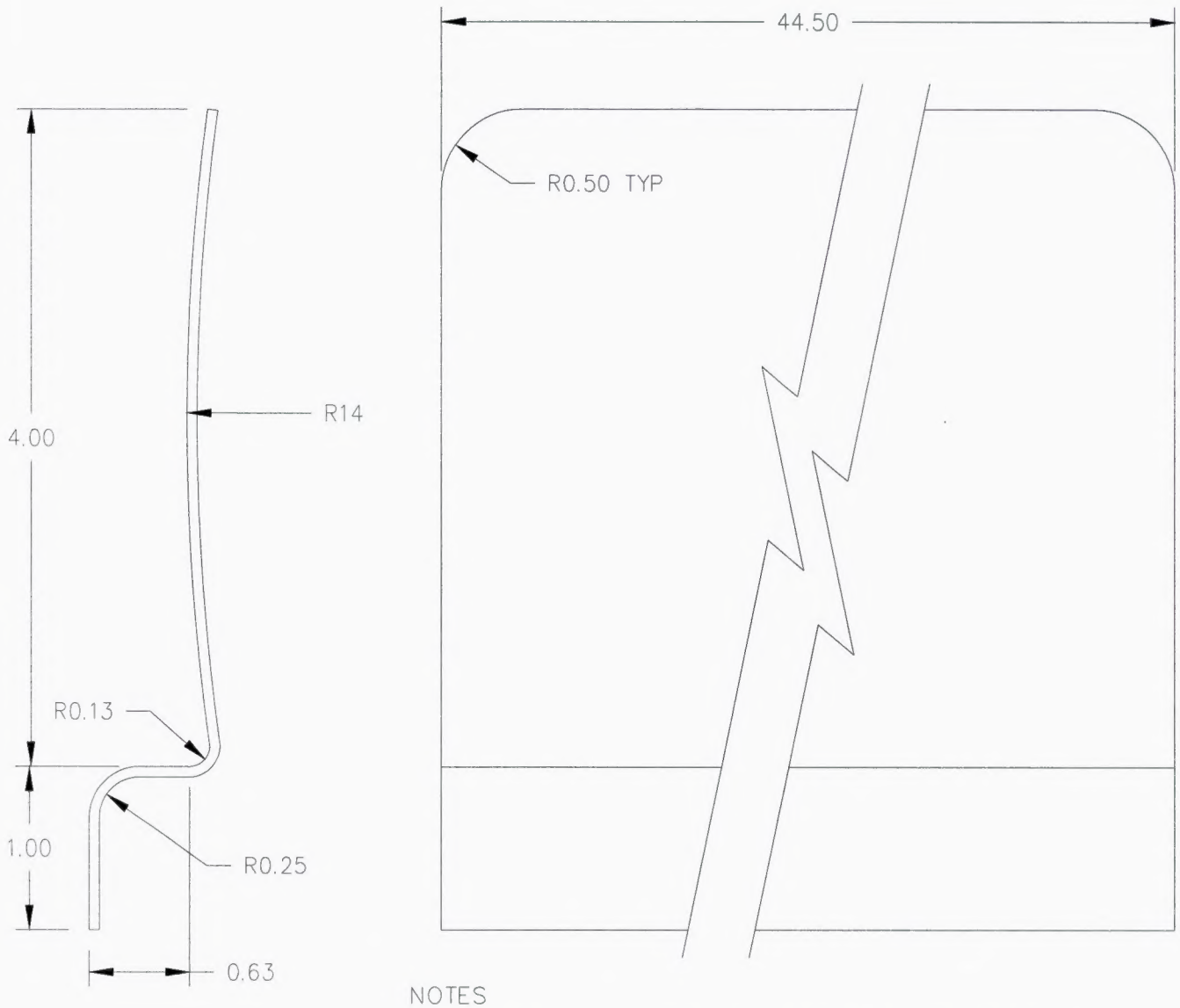
tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca

BELL 212/412/205A-1/205B
RAPPEL STEP
BLOCK

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	79833	0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		



NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. DEGREASE, ALODINE AND PRIME PRIOR TO ASSEMBLY.

QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
1	79834-01	01	KICK PLATE	ALUM SHEET		.063 THICK
01	LIST OF MATERIALS					

APPROVALS		DATE
DRAWN:	R. RATHWELL	07/05/08
CHECKED:	E. BURGOIN	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

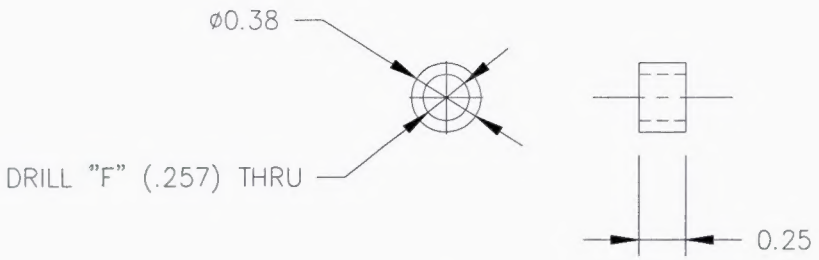
DECIMALS		ANGLES
X.XXX	±0.010	±1/2°
X.XX	±0.03	
X.X	±0.1	

AERO DESIGN LTD.
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M
2013 – 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7
tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca

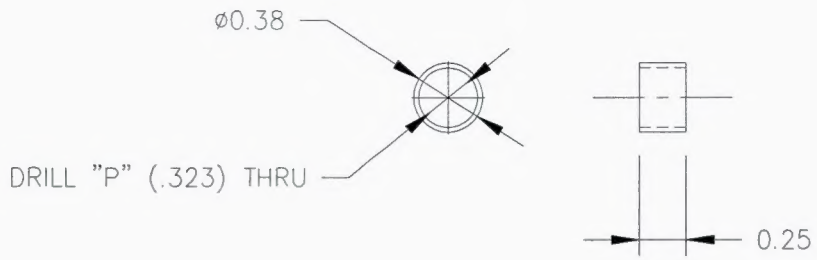
BELL 212/412/205A-1/205B RAPPEL STEP KICK PLATE

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	79834	0

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSSUE		



(01) BUSHING



(02) BUSHING

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
1	79835-02	02	BUSHING	304 STAINLESS ROD	ASTM-A276	3/8 DIA
1	79835-01	01	BUSHING	304 STAINLESS ROD	ASTM-A276	3/8 DIA

QTY — LIST OF MATERIALS

APPROVALS	DATE
DRAWN: R. RATHWELL	07/05/08
CHECKED: E. BURGOIN	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES ON:

DECIMALS	ANGLES
X.XXX ±0.010	±1/2°
X.XX ±0.03	
X.X ±0.1	

AERO DESIGN LTD.
CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M
2013 – 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7
tel: (403) 250-8027 fax: (403) 250-8333 www.aerodesign.ca

BELL 212/412/205A-1/205B RAPPEL STEP BUSHING

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	79835	0

CP798

APPLICANT: AERO Design Ltd.
2013 - 39th Ave N.E.
Calgary, Alberta
T2E 6R7

CORRESPONDANCE TO: AERO Design Ltd.
(If other than applicant) 2013 - 39th Ave N.E.
Calgary, Alberta
T2E 6R7

DATE: 07 May, 2008
REV. No. 0

MAKE: Bell Helicopter
MODEL: 212, 412, 205A-1, 205B

REGISTRATION:
SERIAL No.:

NATURE OF WORK: Rappel Step installed on Helicopter Hardpoints

MODEL CERTIFICATION BASIS: FAR 29, at amendment 29-2
MODIFICATION CERTIFICATION BASIS: FAR 29, at amendment 29-2

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B	**Flight**				
29.29	Empty Weight & Corresponding CG	Installation Drawing			
29.45 – 29.79	Performance	N/A - Not Significant			Position and size of this installation will not significantly alter the performance and flight characteristics of the type approved aircraft.
29.141 – 29.241	Flight Characteristics	N/A - Not Significant			
29.251	Vibration	Flight Test		X	TP798.02 Flight
Subpart C	**Structure**				
29.301	Loads - Personnel	Engineering Report		X	Design loads appropriate to function are used.
29.301	Loads – Air	N/A			The step has a small surface area.
29.303	Factor of Safety	Engineering Report		X	
29.305	Strength and Deformation	Engineering Report		X	
29.307	Proof of Structure	Engineering Report		X	
29.337	Manouvering Load Factor	N/A			Rappeler is attached to a belay line, which supports the majority of his weight. Helicopter is normally in a hover at this time. The step is an aid to stepping down to the landing gear tube.
Subpart D	**Design & Construction**				
29.601	Design	N/A			There are no unusual features on this installation.
29.603	Materials	Engineering Report		X	
29.605	Fabrication Methods	Fabrication Drawing		X	

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
29.609	Protection of Structure	Fabrication Drawing		X	
29.613	Material Strength Properties & Design Values	Fabrication Drawing		X	

AERO Design Ltd.

LSH08-157/D

Signed

FLIGHT TEST PLAN

TP 757.02

Rappel Step

Bell 212, 412, 205A-1, 205B

Revision 0
13 May 2008

AERO Design Ltd.
Engineering Consultants

2013 – 39th Avenue N.E., Calgary, Alberta T2E 6R7
Phone: (403) 250-8027
Fax: (403) 250-8333
E-Mail: info@aerodesign.ca

TABLE OF CONTENTS

1.0 INTRODUCTION

This document tests the installation of the AERO Design rappel step onto an Apline Helicopters Bell 212.

2.0 REFERENCE

Aero Design Ltd. Drawing 79801, Rappel Step Installation

Bell 212 Rotorcraft Flight Manual, BHT-212VFR-FM-1 (Current Revision)

3.0 BASIS OF CERTIFICATION

Bell 412: FAR Part 29 dated 1 February 1965, Amendment 29-1 and 29-2

Bell 212: FAR Part 29 dated 1 February 1965, Amendment 29-1 and 29-2

Bell 205A-1: CAR 7 dated August 1, 1956, Amendments 7-1 through 7-4

Bell 205B: CAR 7 dated August 1, 1956, Amendments 7-1 through 7-4

This installation

Part 29 dated 1 February 1965, Amendment 29-1 and 29-2

This flight test programme will demonstrate that this installation complies with the flight requirements of the original basis of certification.

4.0 FLIGHT TEST PREPARATION

4.1 General

The flight crew should review and be familiar with the regulatory requirements of FAR29.251 *Vibration,* prior to conducting flight tests. These requirements are included as Appendix C.

The flight crew should examine and be familiar with the modification installed including a review of the proposed Flight Manual Supplement (if any).

The flight crew should always be attentive to unusual noises, vibrations, control characteristics, attitudes and instrument indications.

Altitude: The flight test shall be conducted below 1000 feet above sea level.

4.2 Configuration

Modification flight test

Rappel Step to be installed in accordance with AERO Design Ltd. Drawing 79801, Rappel Step Installation.

Those components of the modification which alter the external profile of the aircraft shall be installed in accordance with the applicable installation drawings.

Any other unusual or particularly large external modifications should be removed if practical and all external modifications installed during flight testing should be noted in the flight test report.

Weight: The gross weight of the aircraft shall be less than 7500lbs for this test.

4.3 Flight Authority

The Certificate of Airworthiness may not be valid after the modification has been installed. Flight Authority in the form of a flight permit may be required.

Flight authority to exceed the published V_{ne} of the helicopter is required. When the V_{ne} for the modification as provided in the proposed Flight Manual Supplement does not restrict the maximum speed to less that 90% of the basic helicopter V_{ne} then, the flight permit should specifically state that a higher V_{ne} is authorized.

5.0 FLIGHT TEST PROCEDURE

5.1 Vibration

FAR29.251

Low Speed (below 80 knots)

From a hover, increase forward air speed to 80 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 90 knots

From 80 knots, increase forward air speed to 90 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 100 knots

From 90 knots, increase forward air speed to 100 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 110 knots

From 100 knots, increase forward air speed to 110 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 120 knots

From 110 knots, increase forward air speed to 120 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 130 knots (Vne)

From 120 knots, increase forward air speed to 130 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

Forward 144 knots (Vd)

From 130 knots, increase forward air speed to 144 knots in level flight.

Record: Observe and record any indications of flutter or vibrations.

APPENDIX A

FLIGHT TEST REPORT

BELL 212

Aircraft: C-FALK
Serial no. 30982

Date:14 May 2008
Location: YYC and surrounding area

Configuration: _____
No other external modifications installed on the aircraft.

Crew: Pilot: Mike Lequesne
DAR: Ted Burgoin, Aero Design Ltd.

Flutter and Vibration

TEST	ACCEPTABLE	UNACCEPTABLE	COMMENTS:
LOW SPEED (BELOW 80 KNOTS)	yes		
FORWARD 90 KNOTS	yes		
FORWARD 100 KNOTS	yes		
FORWARD 110 KNOTS	yes		
FORWARD 120 KNOTS	yes		
FORWARD 130 KNOTS (Vne)	yes		
FORWARD 144 KNOTS (Vd)	yes.		

General Notes:

Pilot: Witness:

M. Lequesne

Date: 14 MAY 08

E. Burgoin

Date:

APPENDIX B

WEIGHT CALCULATIONS

Weight for Flight Test Date:_____

Rappel Step Installation

Bell 212

C- FALK , Serial No. 30982

Item	Weight (lbs.)	
Basic Helicopter	~~6533.5~~ 6534 lb	CG ~~143.85~~ 143.94 long, ~~0.19~~ +0.28 Lat
Rappel Step Installation	_____	
Pilot	200	
Passenger	200	
Fuel	800 lb	
Total Weight	_____	

Gross Weight Limit: _____ lb.

Helicopter refueled between flights to specified fuel condition.

APPENDIX C

FAR 29 REQUIREMENTS

Federal Aviation Regulation

Sec. 29.251

Part 29 AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT	
Subpart B--Flight	Miscellaneous Flight Requirements

Sec. 29.251

Vibration.

Each part of the rotorcraft must be free from excessive vibration under each appropriate speed and power condition

Transport Canada Aviation
Transports Canada Aviation

Transport Canada Centre
800 - 1601 Airport Road NE
Calgary, Alberta
T2E 6Z8

RACH 5008-FALK
Tel: (403) 292-5019
Fax: (403) 292-6709

Alpine Helicopters Ltd.
1295 Industrial Rd
Kelowna, BC, Canada
V1Z 1G4

2008-05-14

THIS CONSTITUTES A FLIGHT PERMIT (SPECIFIC PURPOSE) FOR AIRCRAFT:

NATIONALITY AND REGISTRATION MARKS MARQUES DE NATIONALITÉ ET D'IMMATRICULATION	MANUFACTURER AND MODEL CONSTRUCTEUR ET MODÈLE	SERIAL NUMBER NUMÉRO DE SÉRIE
C-FALK	**Bell 212**	**30982**

THIS FLIGHT PERMIT IS SUBJECT TO THE FOLLOWING OPERATING LIMITATIONS:

1. Valid for 3**0 days** from the date of issue or the completion of intended flight(s);
2. Local VFR test flights in accordance with Aero Design Ltd. Flight Test Plan TP 798.02 from Calgary International Airport (YYC), Calgary, AB Canada, with technical landings as required, for the purpose of showing compliance with airworthiness standards for the installation of a Rappel Step;
3. Essential flight crew members only - No Passengers;
4. No flights over built-up areas;
5. The aircraft shall be certified as safe and fit for the proposed flight by a qualified Aircraft Maintenance Engineer (AME) or other such authorized person, in the aircraft journey log book prior to the commencement of the flight;
6. Commercial use prohibited;
7. Ensure that all applicable airworthiness directives have been complied with;
8. Ensure that no airworthiness limitations are exceeded;
9. Permission of the foreign aviation authority required prior to flight in their airspace;
10. This document shall be carried on board the aircraft.

DATE: 2008-05-14 SIGNATURE: [Inspector] Mel Turgeon

For the Minister of Transport - Pour le ministre des Transports

Canada

AERO **DESIGN LTD.**
2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7 aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE:	May 14, 2008	TIME:	9:02 AM
TO:	**Melvin Turgeon**	PHONE:	(403) 292-5019
	Transport Canada – Calgary Office	FAX:	(403) 292-6709
FROM:	**Richard Rathwell**	PHONE:	(403) 250-8027
	Aero Design Ltd.	FAX:	(403) 250-8333

Number of pages including cover sheet: 2

RE: APPLICATION FOR A FLIGHT PERMIT

Melvin,

Attached is an application for a flight permit. The purpose for the flight is for the purpose of showing compliance with airworthiness standards for the installation of a rappel step on a Bell Medium (212, 412, 205A-1, 205B).

Due to contract requirements with our client, we require to conduct this flight test today.

Please call me if you have any questions.

Richard Rathwell

Print / Imprimez

Transport Canada / Transports Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

INSTRUCTIONS

Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

Dactylographier ou écrire en lettres moulées. Consulte Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'acheminer le présent formulaire.

A. AIRCRAFT IDENTIFICATION - IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire	3. Aircraft Manufacturer - Constructeur de l'aéronef	4a. Model - Modèle
ALPINE HELICOPTERS LTD	BELL	212

2. Address - Adresse	4b. Maximum Permissible Take-Off Weight / Masse maximale admissible au décollage	
1295 Industrial Rd Kelowna, British Columbia Canada, V1Z 1G4	5,080 Kg	11,200 lb
	5. Serial Number - Numéro de série	6. Nationality and Registration Marks / Marques de nationalité et d'immatriculation
	30982	C-FALK

B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulue(s))

1. ☐ Ferry flights to a base for repairs or maintenance
   Un vol de convoyage vers une base en vue de réparation ou de maintenance
2. ☐ Delivery, demonstration, market survey, or crew training flights
   Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage
3. ☑ Flights for the purpose of showing compliance with airworthiness standards
   Un vol de démonstration de conformité aux normes de navigabilité
4. ☐ Other purpose (Specify)
   Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS / DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF

Description of Flight(s) *Use attachment when appropriate* / Description du ou des vol(s) *Joindre une feuille au besoin*

1. From - Aérodrome de départ	2. To - Aérodrome de destination	
YYC - CALGARY, ALBERTA	YYC - CALGARY, ALBERTA	
3. Via - Escales	4. Effective date (yyyy - mm - dd) / Date effective (aaaa - mm - jj)	5. Termination date (aaaa - mm - dd) / Date limite (aaaa - mm - jj)
NIL	2008-05-14	2008-08-14

6. Aircraft does not meet the applicable airworthiness requirements as follows:
   Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur :

RAPPEL STEP INSTALLATION IN ACCORDANCE WITH AERO DESIGN LTD. INSTALLATION DRAWING 79801. FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS) TO BE APPROVED, IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.

7. The following maintenance conditions are considered necessary for safe operation:
   Les conditions d'entretien suivantes sont nécessaires pour la conduite des vols en toute sécurité :

LOG BOOK ENTRY BY QUALIFIED AME

8. The following operating conditions are considered necessary for safe operation:
   Les conditions d'exploitation suivantes sont nécessaires pour la conduite des vols en toute sécurité :

NO FLIGHT OVER BUILT-UP AREAS; VFR CONDITIONS; ESSENTIAL CREW ONLY; FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS), IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.

D. SIGNATURES

I hereby certify that the aircraft described above is in a condition for safe operation.
Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature, AME Licence No., ACA No. or RCA No.
Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et

Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

2008 May 13

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

24-0044 (0710-06)

Canada

AERO **DESIGN LTD.**
2013 – 39th Ave N. E., Calgary, Alberta, T2E 6R7 aerodesign@telusplanet.net

F A X C O V E R S H E E T

DATE:	May 14, 2008	TIME:	8:20 AM
TO:	**David McNab**	PHONE:	(403) 292-5008
	Transport Canada – Calgary Office	FAX:	(403) 292-6709
FROM:	**Richard Rathwell**	PHONE:	(403) 250-8027
	Aero Design Ltd.	FAX:	(403) 250-8333

Number of pages including cover sheet: 2

RE: APPLICATION FOR A FLIGHT PERMIT

David,

Attached is an application for a flight permit. The purpose for the flight is for the purpose of showing compliance with airworthiness standards for the installation of a rappel step on a Bell Medium (212, 412, 205A-1, 205B).

Due to contract requirements with our client, we require to conduct this flight test today.

Please call me if you have any questions.

Richard Rathwell

Print / Imprimer

Transport Canada / Transports Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

INSTRUCTIONS
Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

Dactylographier ou écrire en lettres moulées. Consulte Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'acheminer le présent formulaire.

A. AIRCRAFT IDENTIFICATION - IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire	3. Aircraft Manufacturer - Constructeur de l'aéronef	4a. Model - Modèle
ALPINE HELICOPTERS LTD	BELL	212

2. Address - Adresse	4b. Maximum Permissible Take-Off Weight / Masse maximale admissible au décollage	
1295 Industrial Rd Kelowna, British Columbia Canada, V1Z 1G4	5,080 Kg	11,200 lb

5. Serial Number - Numéro de série	6. Nationality and Registration Marks / Marques de nationalité et d'immatriculation
30982	C-FALK

B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulue(s))

1. ☐ Ferry flights to a base for repairs or maintenance
   Un vol de convoyage vers une base en vue de réparation ou de maintenance
2. ☐ Delivery, demonstration, market survey, or crew training flights
   Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage
3. ☑ Flights for the purpose of showing compliance with airworthiness standards
   Un vol de démonstration de conformité aux normes de navigabilité
4. ☐ Other purpose (Specify)
   Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS - DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF

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1. From - Aérodrome de départ	2. To - Aérodrome de destination	
YYC - CALGARY, ALBERTA	YYC - CALGARY, ALBERTA	
3. Via - Escales	4. Effective date (yyyy - mm - dd) / Date effective (aaaa - mm - jj)	5. Termination date (aaaa - mm - dd) / Date limite (aaaa - mm - jj)
NIL	2008-05-14	2008-08-14

6. Aircraft does not meet the applicable airworthiness requirements as follows:
Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur :

RAPPEL STEP INSTALLATION IN ACCORDANCE WITH AERO DESIGN LTD. INSTALLATION DRAWING 79801.
FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS) TO BE APPROVED, IN ACCORDANCE WITH AERO DESIGN LTD.
FLIGHT TEST PLAN TP798.02.

7. The following maintenance conditions are considered necessary for safe operation:
Les conditions d'entretien suivantes sont nécessaires pour la conduite des vols en toute sécurité :

LOG BOOK ENTRY BY QUALIFIED AME

8. The following operating conditions are considered necessary for safe operation:
Les conditions d'exploitation suivantes sont nécesseires pour la conduite des vols en toute sécurité :

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D. SIGNATURES

I hereby certify that the aircraft described above is in a condition for safe operation.
Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature, AME Licence No., ACA No. or RCA No.
Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et
Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

2008 May 13
Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

2008 May 13
Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

24-0044 (0710-06)

Canada

Transport Canada / Transports Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

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Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

Dactylographier ou écrire en lettres moulées. Consulte Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'acheminer le présent formulaire.

A. AIRCRAFT IDENTIFICATION - IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire	3. Aircraft Manufacturer - Constructeur de l'aéronef	4a. Model - Modèle
ALPINE HELICOPTERS LTD	BELL	212

2. Address - Adresse	4b. Maximum Permissible Take-Off Weight / Masse maximale admissible au décollage	
1295 Industrial Rd Kelowna, British Columbia Canada, V1Z 1G4	5,080 Kg	11,200 lb

5. Serial Number - Numéro de série	6. Nationality and Registration Marks / Marques de nationalité et d'immatriculation
30982	C-FALK

B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulue(s))

1. ☐ Ferry flights to a base for repairs or maintenance
   Un vol de convoyage vers une base en vue de réparation ou de maintenance
2. ☐ Delivery, demonstration, market survey, or crew training flights
   Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage
3. ☑ Flights for the purpose of showing compliance with airworthiness standards
   Un vol de démonstration de conformité aux normes de navigabilité
4. ☐ Other purpose (Specify)
   Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS / DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF

Description of Flight(s) ***Use attachment when appropriate*** / **Description du ou des vol(s)** ***Joindre une feuille au besoin***

1. From - Aérodrome de départ	2. To - Aérodrome de destination	
YYC - CALGARY, ALBERTA	YYC - CALGARY, ALBERTA	
3. Via - Escales	4. Effective date (yyyy - mm - dd) / Date effective (aaaa - mm - jj)	5. Termination date (aaaa - mm - dd) / Date limite (aaaa - mm - jj)
NIL	2008-05-14	2008-08-14

6. Aircraft does not meet the applicable airworthiness requirements as follows:
   Raisons pour lesquelles l'aéronef ne satisfait pas aux exigences de navigabilité en vigueur :

RAPPEL STEP INSTALLATION IN ACCORDANCE WITH AERO DESIGN LTD. INSTALLATION DRAWING 79801. FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS) TO BE APPROVED, IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.

7. The following maintenance conditions are considered necessary for safe operation:
   Les conditions d'entretien suivantes sont nécessaires pour la conduite des vols en toute sécurité :

LOG BOOK ENTRY BY QUALIFIED AME

8. The following operating conditions are considered necessary for safe operation:
   Les conditions d'exploitation suivantes sont nécessaires pour la conduite des vols en toute sécurité :

NO FLIGHT OVER BUILT-UP AREAS; VFR CONDITIONS; ESSENTIAL CREW ONLY; FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS), IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.

D. SIGNATURES

I hereby certify that the aircraft described above is in a condition for safe operation.
Je, soussigné, certifie que l'aéronef décrit ci-dessus est en bon état de vol.

Signature, AME Licence No., ACA No. or RCA No.
Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

Canada

Print - Imprimer

Transport Canada / Transports Canada

APPLICATION FOR A FLIGHT PERMIT

DEMANDE DE PERMIS DE VOL

INSTRUCTIONS
Print or type all entries. Reference *Canadian Aviation Regulations Standard 507* for the use and disposition of the form.

Dactylographier ou écrire en lettres moulées. Consulte Règlement de l'aviation canadien norme 507 du Manuel de navigabilité qui précise la façon de remplir et d'acheminer le présent formulaire.

A. AIRCRAFT IDENTIFICATION - IDENTIFICATION DE L'AÉRONEF

1. Owner - Propriétaire	3. Aircraft Manufacturer - Constructeur de l'aéronef	4a. Model - Modèle
ALPINE HELICOPTERS LTD	BELL	212

2. Address - Adresse	4b. Maximum Permissible Take-Off Weight / Masse maximale admissible au décollage	
1295 Industrial Rd Kelowna, British Columbia Canada, V1Z 1G4	5,080 Kg	11,200 lb

5. Serial Number - Numéro de série	6. Nationality and Registration Marks / Marques de nationalité et d'immatriculation
30982	C-FALK

B. PURPOSE OF FLIGHT PERMIT (Check applicable boxes) - OBJECTIF DU PERMIS DE VOL (Cocher la ou les case(s) voulue(s))

1. ☐ Ferry flights to a base for repairs or maintenance
   Un vol de convoyage vers une base en vue de réparation ou de maintenance
2. ☐ Delivery, demonstration, market survey, or crew training flights
   Un vol de livraison, de démonstration, d'étude de marché ou d'entraînement d'équipage
3. ☑ Flights for the purpose of showing compliance with airworthiness standards
   Un vol de démonstration de conformité aux normes de navigabilité
4. ☐ Other purpose (Specify)
   Autre fin (Préciser)

C. FLIGHT DESCRIPTION AND AIRCRAFT LIMITATIONS - DESCRIPTION DU VOL ET LIMITATIONS DE L'AÉRONEF

Description of Flight(s) *Use attachment when appropriate* / Description du ou des vol(s) *Joindre une feuille au besoin*

1. From - Aérodrome de départ	2. To - Aérodrome de destination	
YYC - CALGARY, ALBERTA	YYC - CALGARY, ALBERTA	
3. Via - Escales	4. Effective date (yyyy - mm - dd) / Date effective (aaaa - mm - jj)	5. Termination date (aaaa - mm - dd) / Date limite (aaaa - mm - jj)
NIL	2008-05-14	2008-08-14

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RAPPEL STEP INSTALLATION IN ACCORDANCE WITH AERO DESIGN LTD. INSTALLATION DRAWING 79801. FLIGHT TO Vd (Vne X 1.1 = 144 KNOTS) TO BE APPROVED, IN ACCORDANCE WITH AERO DESIGN LTD. FLIGHT TEST PLAN TP798.02.

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LOG BOOK ENTRY BY QUALIFIED AME

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Signature, AME Licence No., ACA No. or RCA No.
Signature, N° de licence de TEA, N° d'autorisation ou N° d'autorisation restreinte
and - et
Signature of the Registered Owner or Authorized Representative
Signature du propriétaire enregistré ou du représentant autorisé

2008 MAY 13
Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

2008 May 13
Date (yyyy - mm - dd)
Date (aaaa - mm - jj)

24-0044 (0710-08)

Canada

Fax (403) 250 - 8333

Barry Newman

From: Richard Rathwell [richard@aerodesign.ca]
Sent: May 13, 2008 8:23 AM
To: 'Barry Newman'
Subject: JOB 798 - Rappel Step - Flight Test

Barry,

For the rappel step flight test, we require the following;

a. Reg. and s/n of the helicopter to be used, C-FALK S/N 30982
b. Weight and CG of the helicopter, 6533.5 lbs 143.85 CG → .19 lateral
c. Date available for testing, 14 May 08
d. The name and contact info of the local AME to sign off the installation, and Mike Lequesne
e. The name of the pilot. Mike Lequesne (403) 815-5968

Thanks,

Richard

→ Credit

CONFORMITY INSPECTION RECORD

Applicant	Aeronautical Product			Title of Change
AERO Design Ltd.	Rappel Step Installation			Rappel Step Installation
	Make	Model	Serial No.	Registration
	Bell	212	30982	C-FALK

Drawing No.	Applicant's Inspector Signature	Date	T.C. Inspection Signature	Date	Findings
79801	Mike Devine	Mar 14/08			

APPLICANT'S ATTESTATION

I hereby confirm that the prototype installation for the subject

☒ MODIFICATION,

☐ REPAIR,

☐ TSO/AP-TC ARTICLE

is in conformity with the applicable installation drawing(s) listed above and that necessary ground tests have been carried out.
[Please check (✓) the applicable box.]

Additional Information:

Signature: Mike Devine ACA-30

TC INSPECTION

☐ ACCEPTABLE

☐ UNACCEPTABLE

Remarks:

Signature: _____

AIRWORTHINESS NOTICE B043 EDITION 2, dated 28 January 2000

CONFORMITY INSPECTION ASSOCIATED WITH APPLIANCE TYPE CERTIFICATION OR MODIFICATION/REPAIR APPROVAL PROJECTS

(This Airworthiness Notice supersedes AN No. B043 Edition 1, dated 24 April 1998.)

Purpose

The purpose of this notice is to explain the responsibilities of an applicant prior to requesting a conformity inspection associated with the prototype evaluation of a supplemental type certificate (STC), a limited supplemental type certificate (L/STC), a repair design certificate (RDC), a TSO and/or an appliance type certificate (AP-TC) installation. This revision is intended to clarify the qualifications for those persons responsible for the conformity inspections.

Background

In several cases, prototype installations have not been performed in accordance with the applicant's installation drawings nor have the necessary ground tests been conducted, where required, prior to seeking a conformity inspection by Transport Canada (TC). This situation may often result in ineffective use of TC resources.

Conformity Requirements (Prototype Installation)

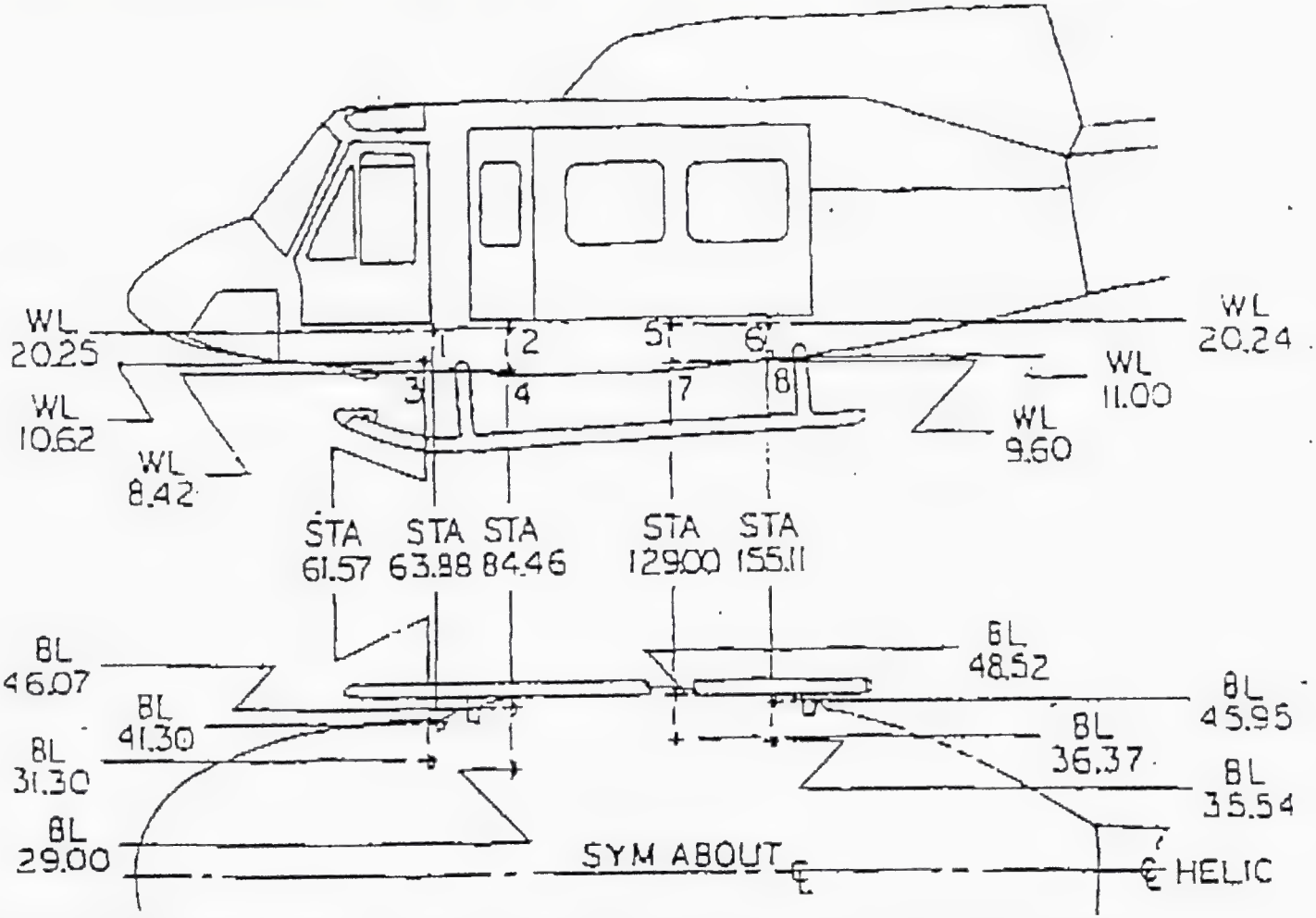
The need for a conformity inspection by Transport Canada on a prototype installation associated with an STC, L/STC, RDC, AP-TC or TSO design approval project will be determined by the regional engineer responsible for the project, and the applicant will be advised accordingly. Where such a requirement has been identified, the prototype installation is to be verified by the applicant or his designated person for conformity with the applicable installation drawings and, where required, ground tests performed to determine functionality. The above functions are to be carried out prior to the applicant requesting the required conformity inspection by TC representatives.

Confirmation

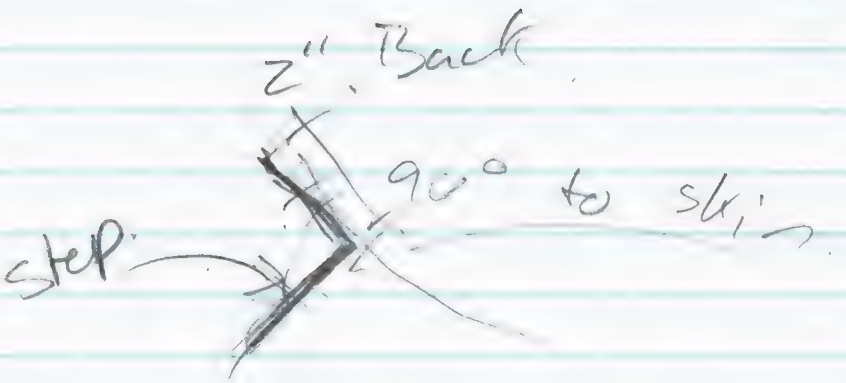
A written confirmation is to be provided to the responsible regional project engineer using the Conformity Inspection Record form appended to this notice, or an equivalent form acceptable to TC. The completed form is to be signed by an appropriately rated Aircraft Maintenance Engineer (AME) or Approved Maintenance Organization (AMO). TC form 24-0045 (Conformity Certificate - Repair or Modification), which is intended to certify the installation of an approved modification or repair, should not be used as a Conformity Inspection Record. The Conformity Inspection Record should be accompanied by details pertaining to the location of the test article, the proposed modification or repair, and a proposed date for accomplishing the conformity inspection by TC Airworthiness Inspectors.

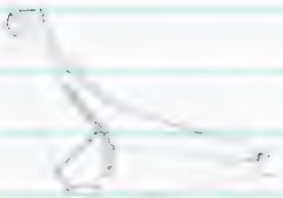
EXTERNAL HARDPOINTS: MODELS 205, 212, 214B & 412

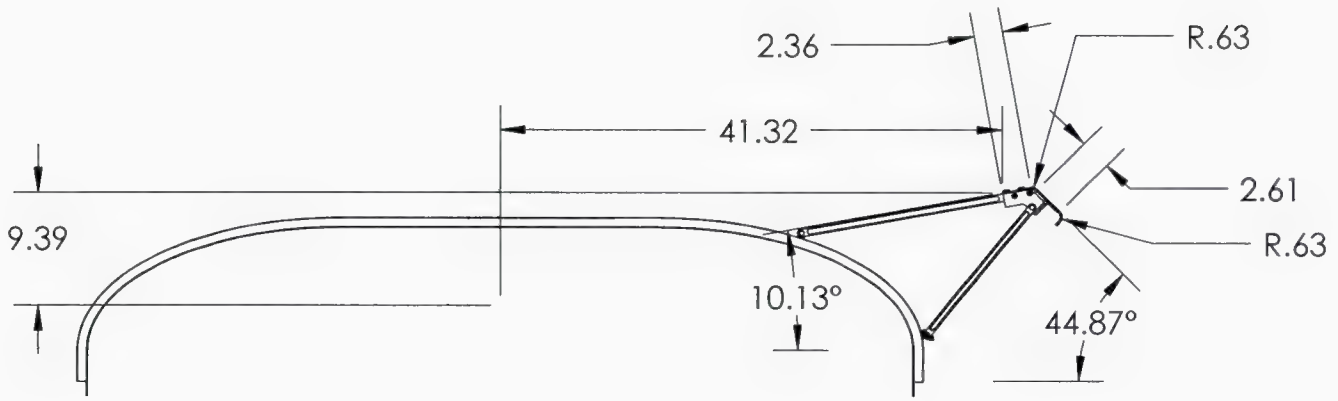
FUSELAGE LOCATIONS AND ALLOWABLE ULTIMATE LOADS

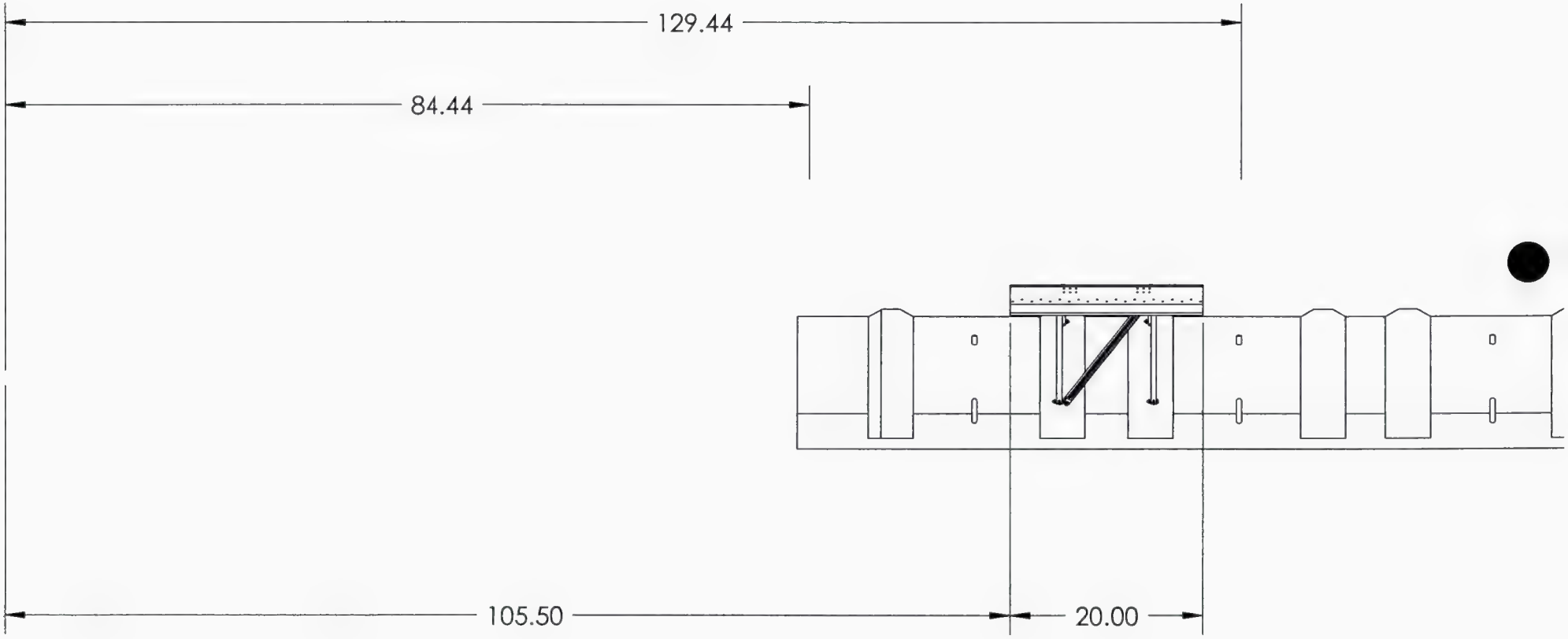


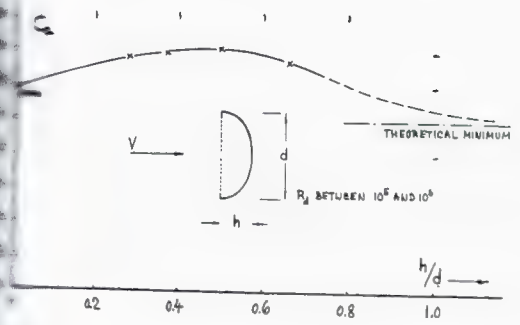
CAUTION: Helicopter C.G. limits must be maintained for all equipment or stores configurations which attach to any or all of these hard-points.


2" Back
90° to skiing
step




2.36
R.63
41.32
2.61
9.39
R.63
10.13°
44.87°


129.44
84.44
105.50
20.00



Drag coefficient of sheet-metal "caps" (40,a) as a function of their height ratio.

Cups and Cups. As large as the drag coefficients of [illegible] may be, there are other shapes exhibiting still higher values. Figure 31 shows the drag coefficient of open cup- or cap-like bodies (similar to parachute canopies). The maximum drag coefficient (on projected area) is obtained for h/d in the order of 0.2, a shape which is ≈ hemispherical. Upon further increasing the height ratio, the rear side more and more changes into a wake "fairing". The drag coefficient is, therefore, expected to approach the theoretical minimum which corresponds to full stagnation pressure across the opening.

Figure 32 (near). Drag coefficients of various 3-dimensional bodies (40) at R'numbers between 10^4 and 10^6. Note: (•) tested on wind-tunnel floor.

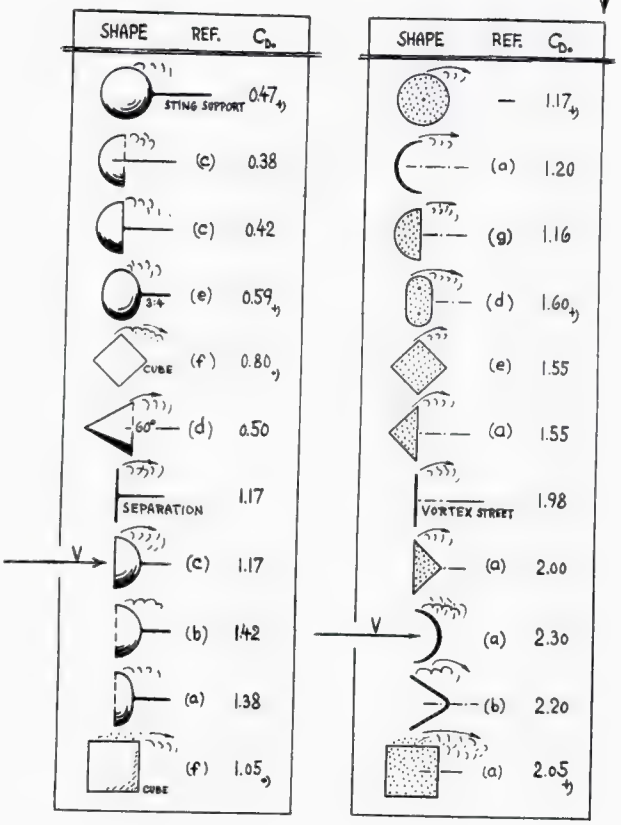
Information on rear-side pressure of plates:
[illegible] disks and small-aspect-ratio plates see: NACA (36, [illegible] Ergebnisse IV; reference (40,f).
[illegible] plates between walls see: (12), (35,a) and (40,f).
Experimental results on three-dimensional bodies:
[illegible]h. Parachute Models, Lufo 1938 p.577.
[illegible]A. Cup Anemometer, Tech Rpt 513 (1935).
[illegible] Hemispherical Bodies, Ergebnisse IV (1932).
[illegible] Recherches a Tour Eiffel, Paris 1907.
[illegible]spherical Cup at $R_d = 2\ 10^5$, ARC RM 712 (1919).
[illegible]nger and Nokkentved, Elementary Bodies and [illegible] Kopenhagen 1930 and 1936; Transl'n by Jarvis.
[illegible]ections (tested between plates or walls):
[illegible]. Simple Shapes, NACA T. Rpt 619 (1940).
[illegible]kers Wind-Tunnel, Report Ströte V.9609 (1940).
[illegible]ference Between Struts, NACA T. Rpt 468 (1933).
[illegible]-Sorensen, Various Shapes, NACA T.Note 3038.
[illegible] Göttingen, Ergebnisse II (1923) and III (1926).
[illegible]kers Wind-Tunnel Result on Angle Profile.
[illegible]rted by Barth, Zt.Flugwissen 1954 p.309.
Free-streamline (cavitation) theory:
[illegible]hoff, Free Jet Theory, Crelle 1869 (see Lamb).
[illegible]eff, Russian Phys.-Chem. Society 1881 (see Lamb).
[illegible]chinsky-Plesset-Schafer, Journal Appl.Physics 1948 [illegible] and Review Modern Physics 1948 p.228.
[illegible]hardt, Laws of Cavities, German ZWB UM 6628.
[illegible]eef, Dive Brakes, Fieseler Tunnel Rpt 22 (1941).

7. DRAG OF WEDGES AND CONES

Figures 32 and 33 present shape and drag coefficient of a number of three- and two-dimensional bodies. All of these shapes have a more or less separated flow pattern; most of them have negative pressure on their rear side; and their drag coefficients are comparatively high.

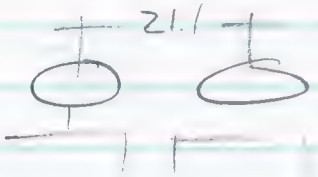
Angle of Flow. To establish some order in the drag coefficients of various shapes, the geometrical angle is very useful, at which the flow is guided by the body's surface upon separating from its rear side. The flat plate, for example, has such an angle "ε" = 90°. A "fold" with a vertex angle of two times 45°, has a separation angle of 90° plus or minus 45°, depending upon the direction of the oncoming flow. Figure 34 demonstrates how the drag coefficient increases as a function of the shape angle. Two branches are found, of course; one for two-dimensional bodies (between walls) and another one for three-dimensional conditions. At "ε" = 0, parallel-sided round-nosed shapes have been used in the graph; a hallow, scoop-like body is plotted at 180°.

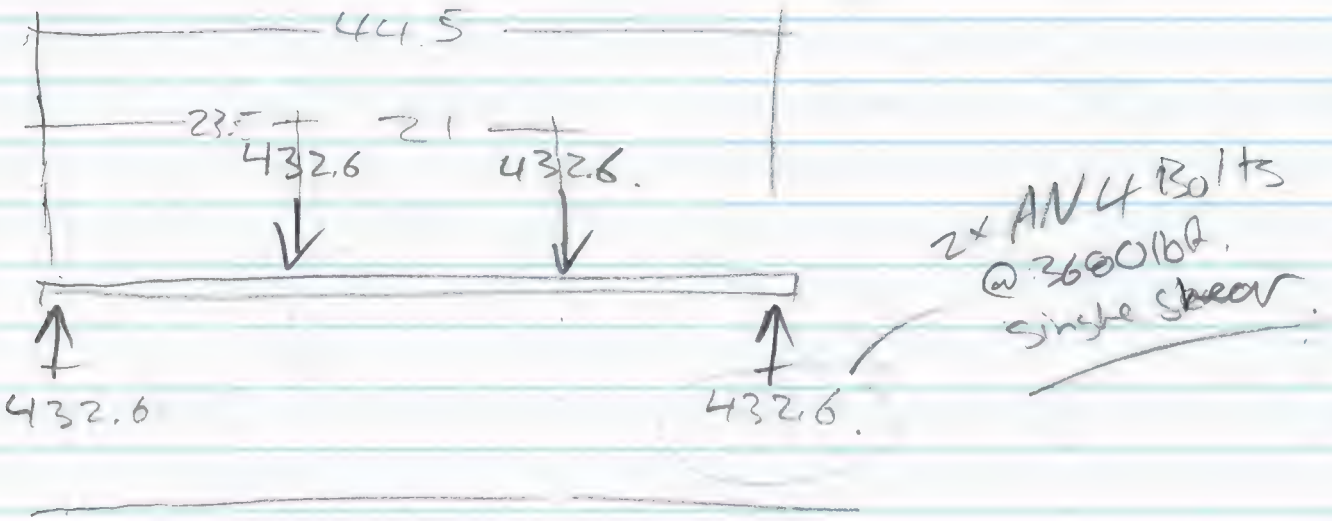
Figure 33 (right). Drag coefficients (41) of 2-dimensional shapes (between walls) at R between 10^4 and 10^6. Note: (+) in subcritical flow.



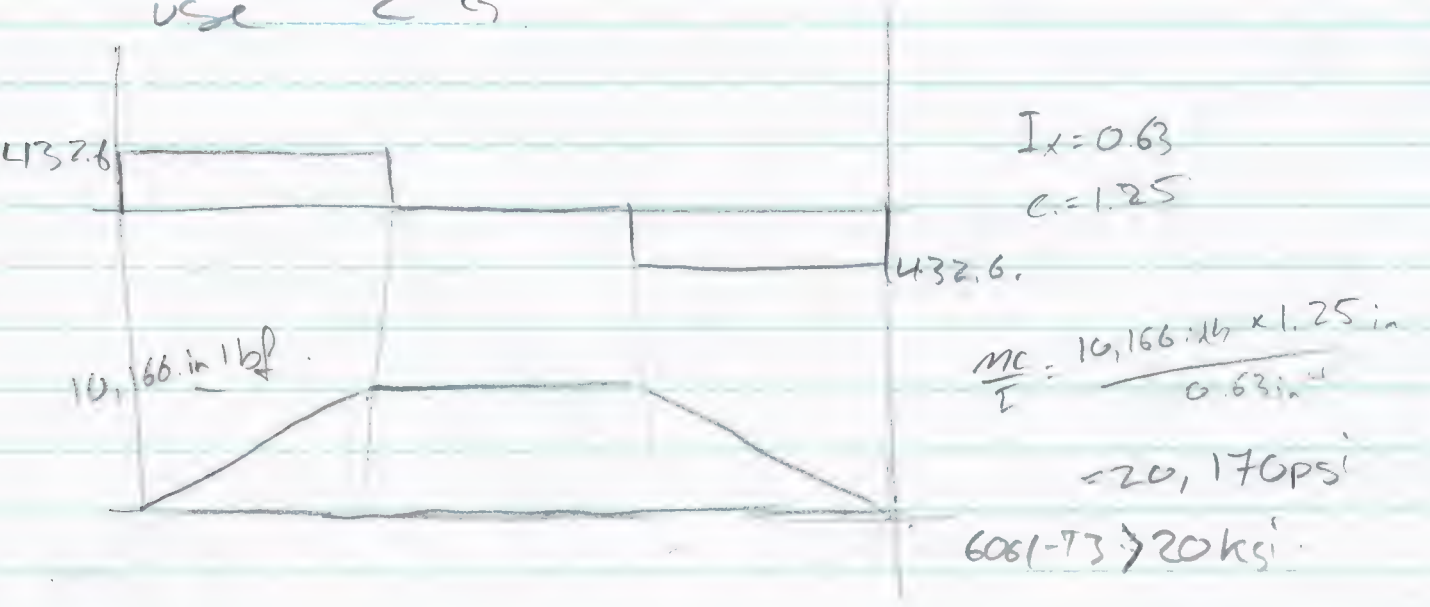
w/ analysis for persons using the step to enter the
798 Eng. aircraft.

Bending.
w/ assumption 2 × 95th percentile males.
wt. per person 216.3 lbf.





No regulatory for load.
use 2 G



TO: RICHARD

FROM: MIKE @ ALPINE HELICOPTERS

1 PAGE TO FOLLOW.

Alpine
HELICOPTERS LTD.

1295 Industrial Road
Kelowna, British Columbia
Canada V1Z 1G4
Telephone: (250) 769-4111
Facsimile: (250) 769-2040

TO: Richard

DATE:

FAX NO.:

FROM: Doug

NO.OF PAGES TO FOLLOW: 1

Please forward Weight & Station Step for W+B amendments for log book entry.

Thanks

Doug

Long Cal CG. 798

	wt	stn. (in)	moment
step	6.9 lb	106.73	736.44
Fwd.	1.6 lb	84.46	135.14
Aft	1.0 lb	129.00	129.00
	9.5 lb		999.58 / 9.5 lb

Stn CG = 105.22 in

	wt.	BL (in)	moment
step	6.9 lb	46.06	317.814
Fwd	1.6 lb	41.82	66.912
AFL	1.0 lb	44.47	44.47
	9.5 lb		429.20 / 9.5 lb

BL CG = 45.18 in

37.0[illegible]

473.48

87.74

84 - BL 46.07

129 34 48.52

3.28

6.07

digital scale.

TRANSPORT CANADA

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- Planning to travel?
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- Vehicle importation
- Vehicle recalls
- Youth Zone
- Proactive disclosure

Employee Directory

Employee Information

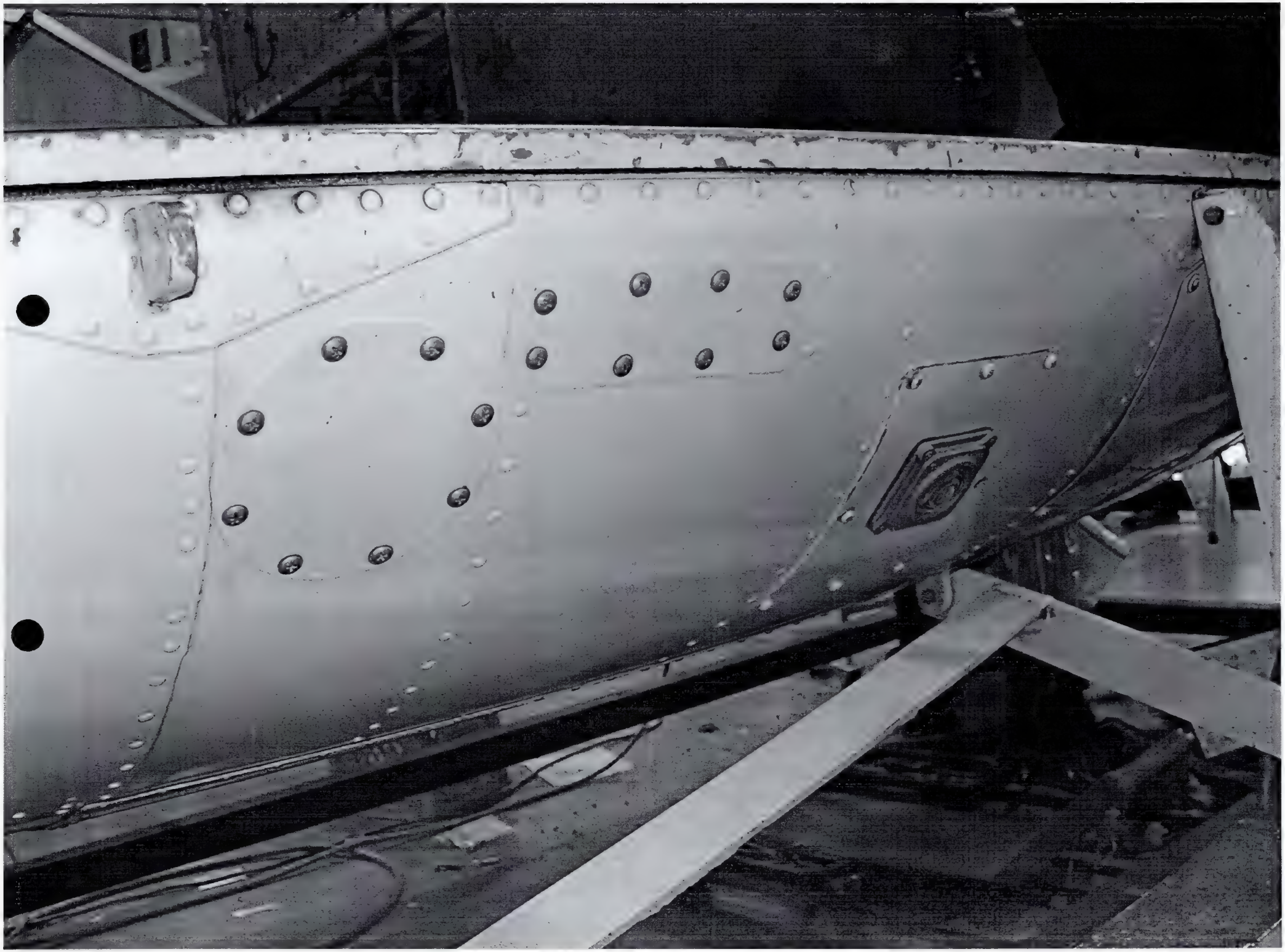
Name:	David McNab
Phone:	(403) 292-5008
Position:	Superintendent, Maintenance and Manufacturing
X400:	c=CA;a=GOVMT.CANADA;p=GC+TC;s=McNab;g=David;
Internet:	mcnabd@tc.gc.ca
Routing Symbol:	RACH
Building:	Calgary, Airport Corporate Centre
Address:	800-1601 Airport Road N-E
City:	Calgary
Province:	Alberta
Postal Code:	T2E 6Z8

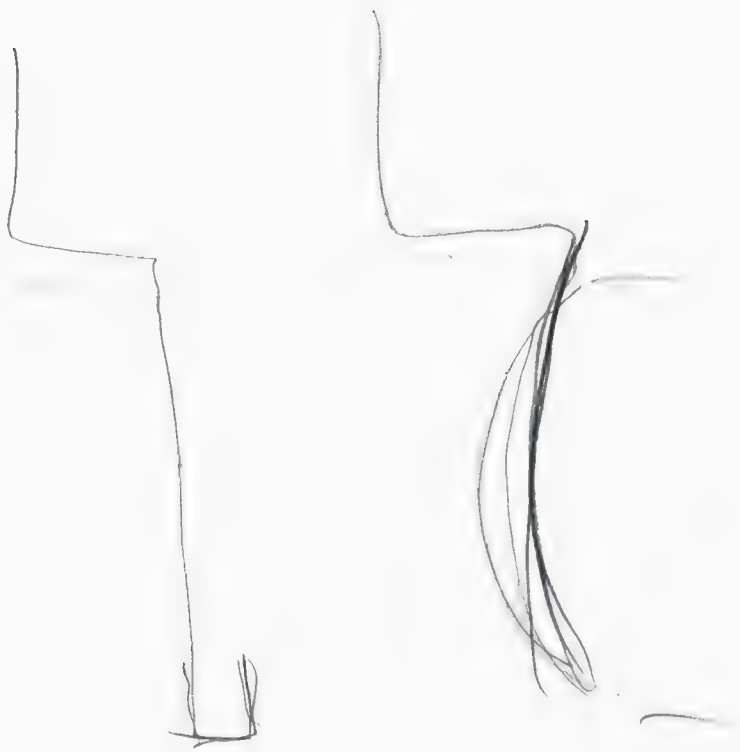
Organization Information

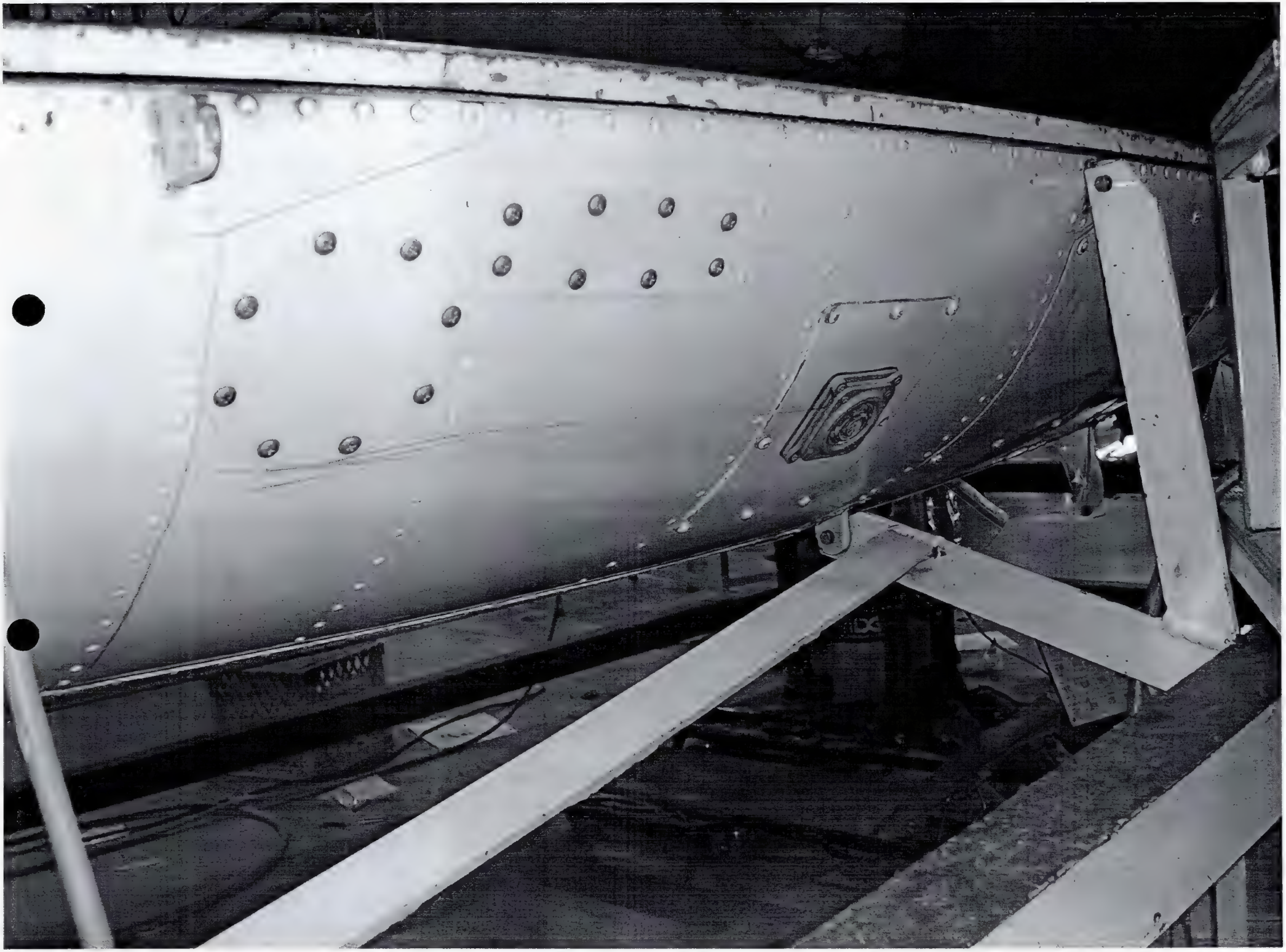
Organization:	Aircraft Maintenance and Manufacturing - Calgary
Address:	Calgary, Airport Corporate Centre 800-1601 Airport Road N-E
City:	Calgary
Province:	Alberta
Postal Code:	T2E 6Z8
Fax:	(403) 292-6709

Organizational Structure

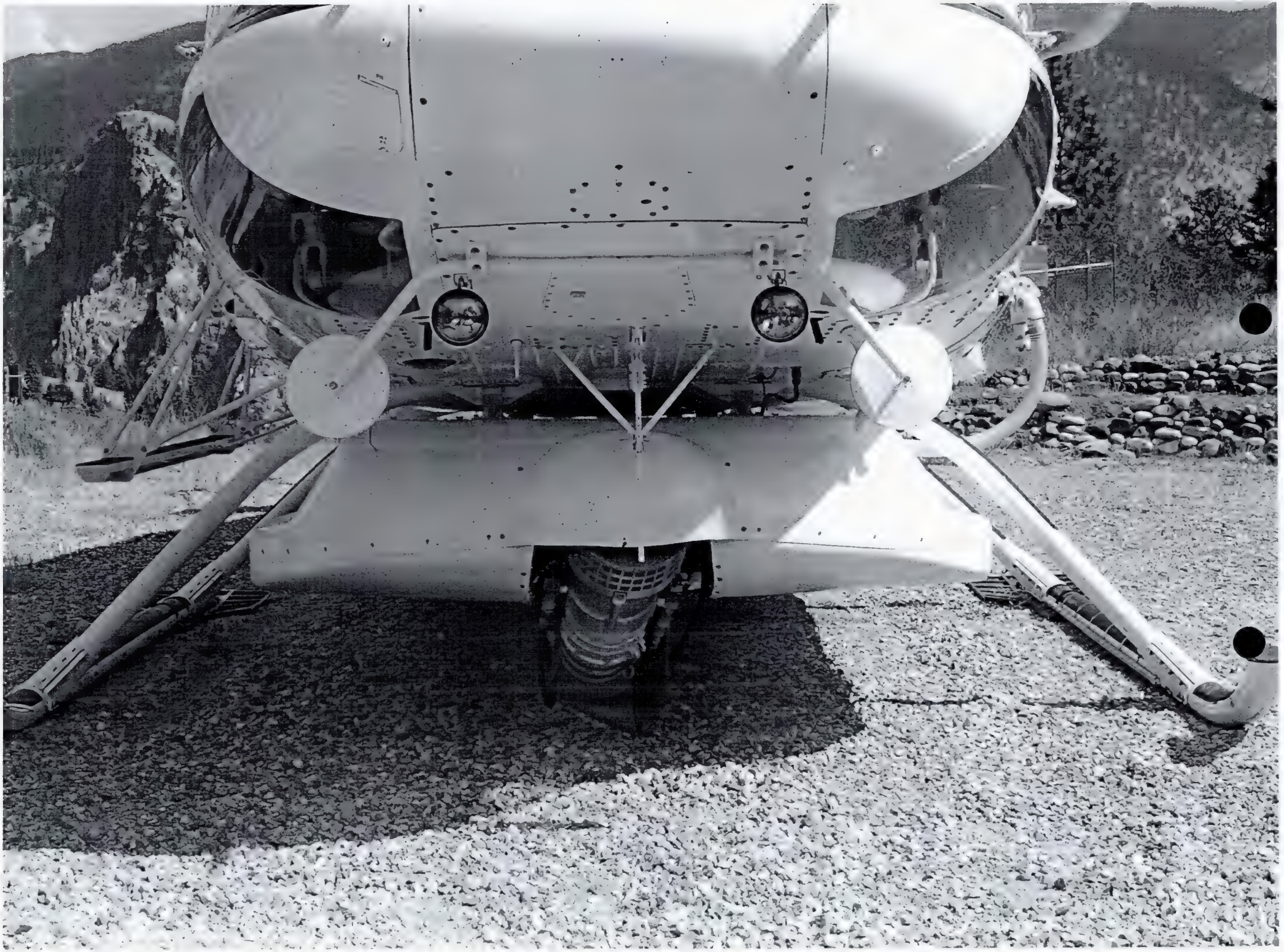
Last updated: 2004-03-23 ▲ Important Notices



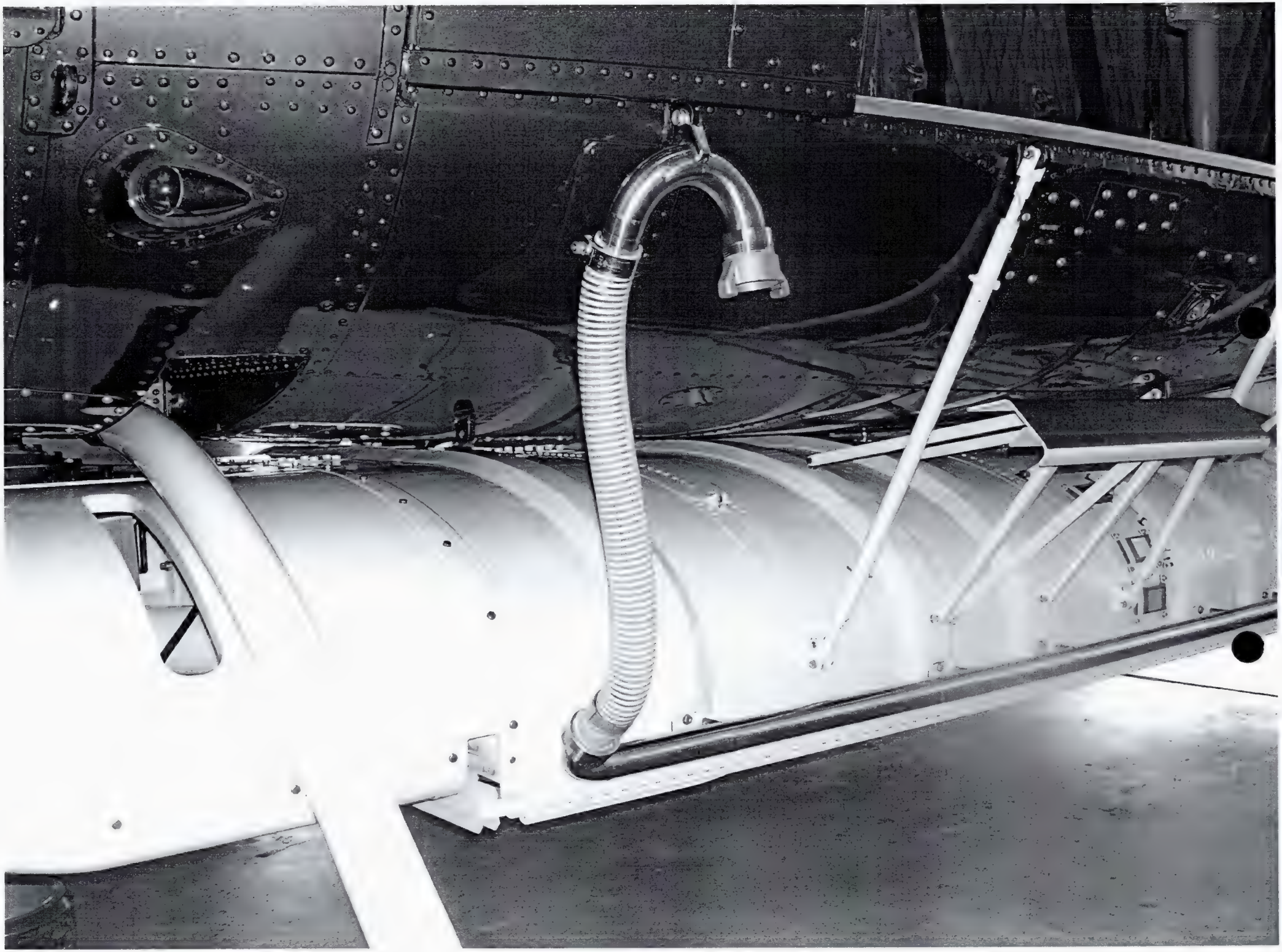


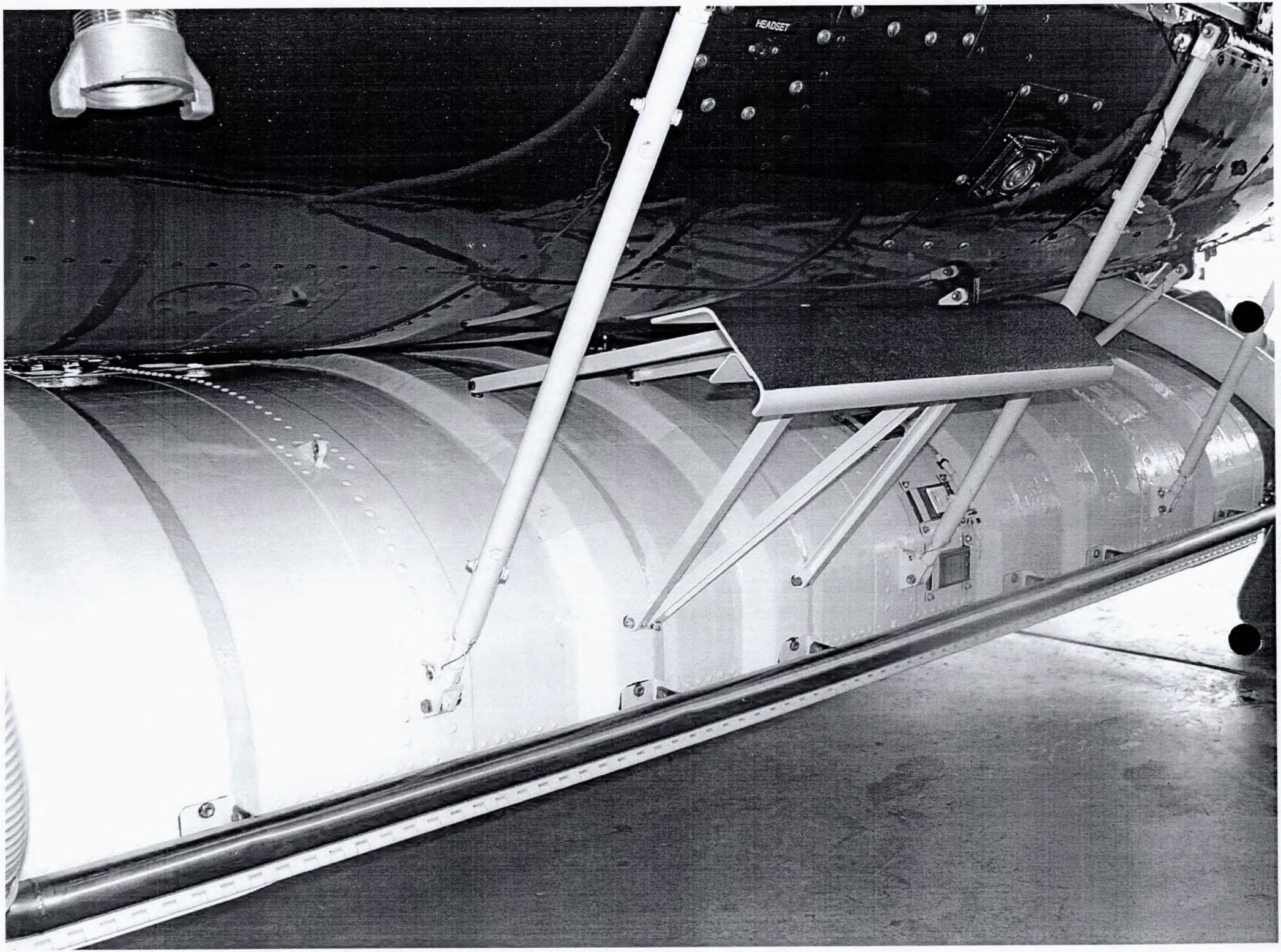


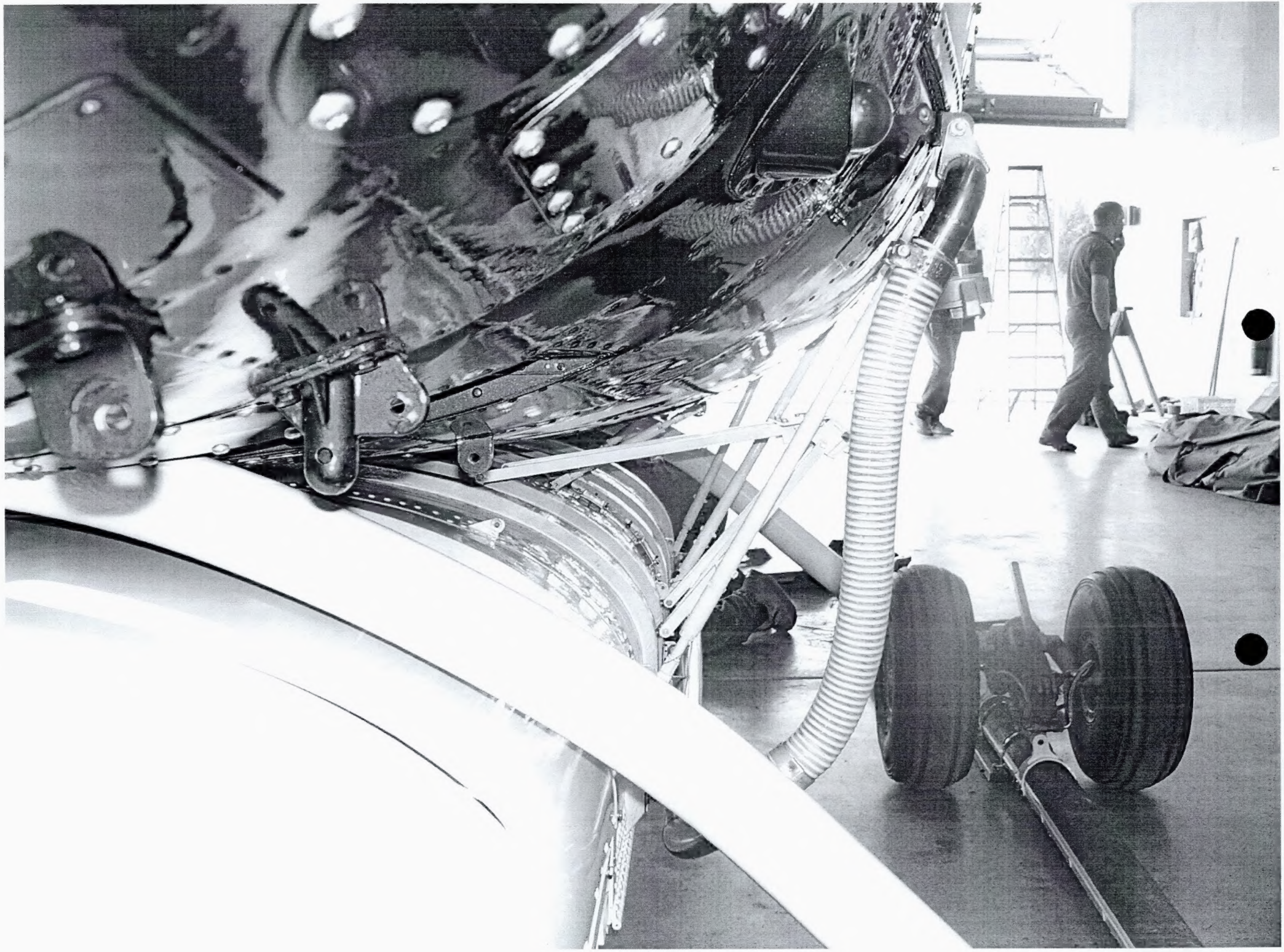

25
84.46
129.00
C-GTUK
Tower Aerospace
"Badger"

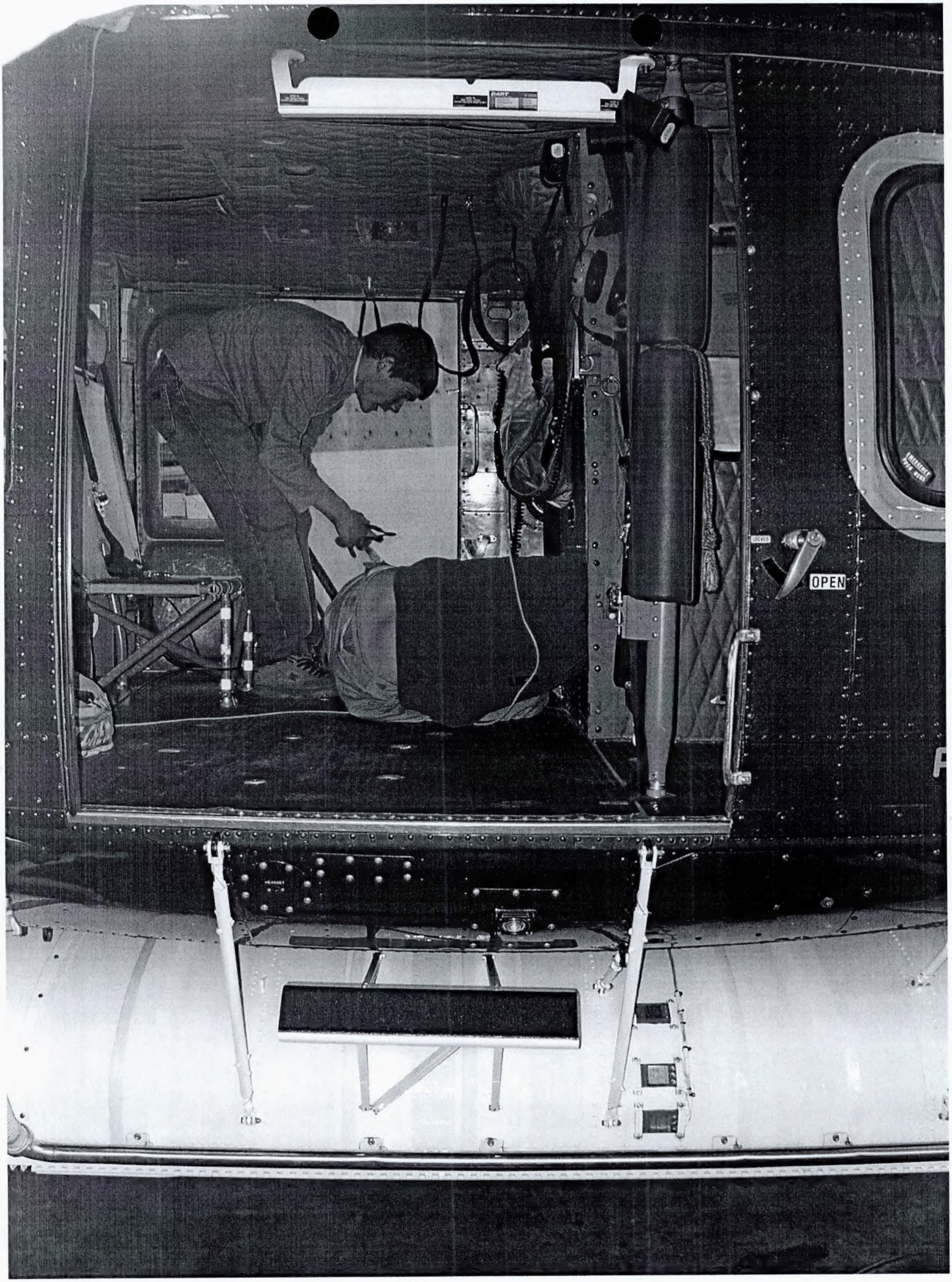


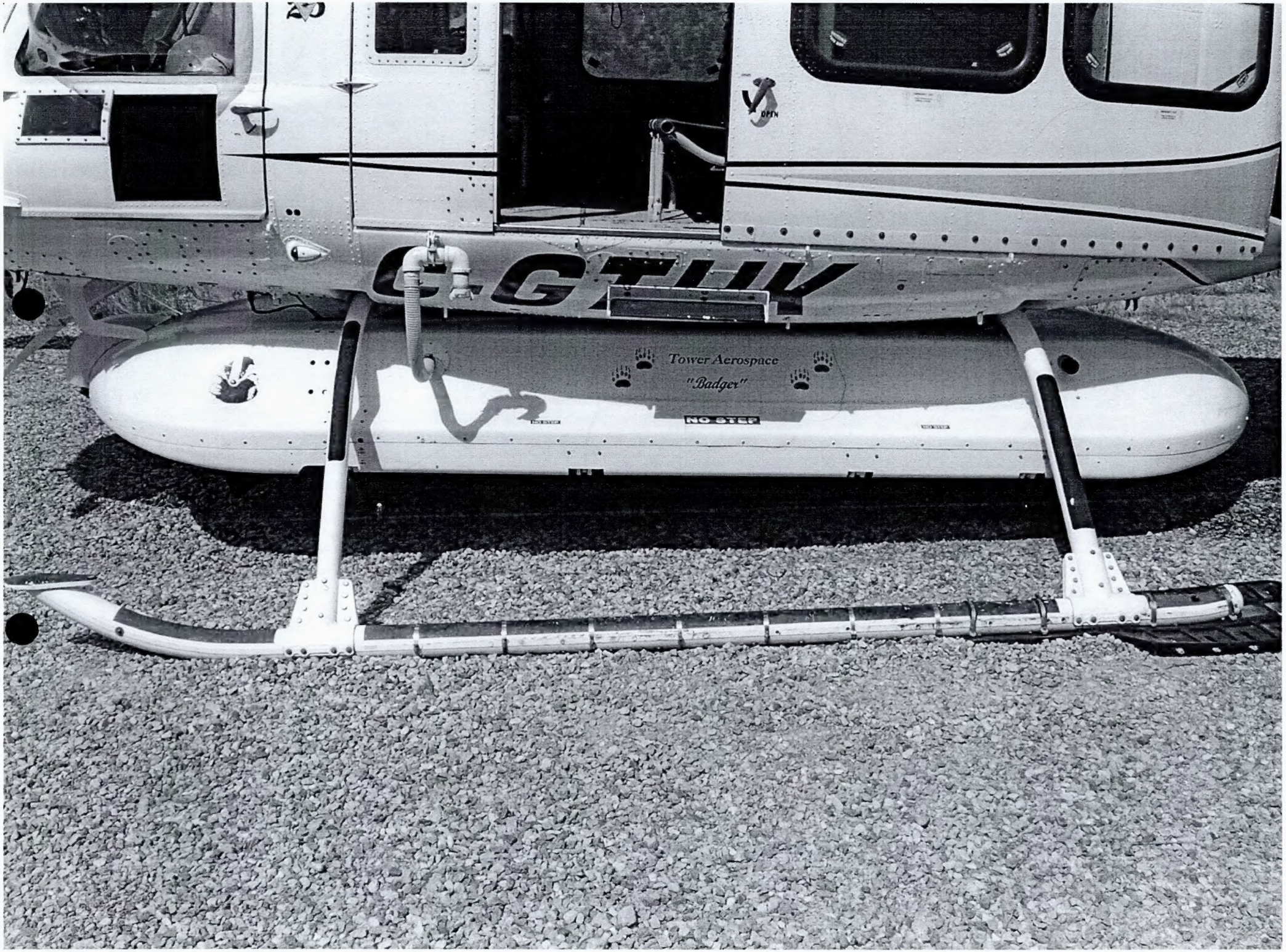

C-GTUK
Tower Aerospace
"Badger"
NO STEP




HEADSET




OPEN


C-GTLK
Tower Aerospace
"Badger"
NO STEP